

## REMARKS

### I. Responses to Examiner's Remarks

The applicants appreciate the Examiner's careful attention to this application. Reconsideration of the application is respectfully requested.

The Examiner has repeated the grouping of claims as set out in the office actions of 3/13/2008, and acknowledged Applicants' previous election of Group II. The Examiner acknowledged on page 5 of the Office Action that "The inventions listed as Group II relate to a single general inventive concept under PCT Rule 13.1..." The Examiner then stated on pages 4-5 that Applicants are required to elect a specific SEQ ID NO for each of the LKB1 polypeptide, the STRAD polypeptide, the MO25 polypeptide, and the substrate.

### III. Election With Traverse

Applicants provisionally elect with traverse: (1) an LKB1 polypeptide comprising residues 44-343 of SEQ ID NO: 6; (2) a STRAD polypeptide comprising a C-terminal pseudokinase domain, said C-terminal pseudokinase domain comprising the C-terminal sequence Trp-Glu-Phe; (3) an MO25 polypeptide comprising SEQ ID NO: 11; and (4) the substrate comprising SEQ ID NO: 110.

#### A. The Restriction Requirement is Unclear and Contradictory

Applicants respectfully submit that the restriction requirement is improper. No basis is provided for requiring restriction. "When making a lack of unity of invention requirement, the examiner must (1) list the different groups of claims and (2) explain why each group lacks unity with each other group (i.e., why there is no single general

inventive concept) specifically describing the unique special technical feature in each group.” MPEP 1893.03(d). In this case, the Examiner has done neither.

The Examiner provided no explanation as to why the claims lack unity of invention; for that matter, the Examiner has not even stated that the claims lack unity of invention. Under the Patent Cooperation Treaty, the requirement for unity of invention referred to in Rule 13.1 shall be fulfilled only when there is a technical relationship among those inventions involving one or more of the same or corresponding special technical features. See PCT § 13.2.

Far from explaining why the claims lack unity of invention, the Office Action states that there is unity of invention among the claims. The Examiner states on page 5, first paragraph

The inventions listed as Group II relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they comprise the same or corresponding special technical feature, an in vitro composition comprising LKB 1, STRAD, and M025 polypeptides and a method for identifying LKB 1 activity modulators using said in vitro composition.

As it is the Examiner’s position that the inventions listed as Group II (currently elected) comprise the same or corresponding technical feature, it must follow that there is unity of invention among the inventions listed as Group II. As there is unity of invention, restriction is improper.

Furthermore, the Office Action does not state between which inventions restriction is required. The Office Action does not define any inventions that lack unity, but merely states that Applicants are required to elect “one specific” polypeptide for each of LKB1, STRAD, M025 and the substrate. Applicants are uncertain as to what is required. Furthermore, Applicants are uncertain as to what is required with regard the

requirement that Applicants “elect one specific substrate (SEQ ID NO:) encompassed by Claims 3-5, 16, and 19-20.” Claims 3-5 and 16 do not recite the limitation of a substrate.

Independent Claims 3 and 19 are directed to an embodiment of STRAD that comprises a C-terminal pseudokinase domain comprising the C-terminal sequence Trp-Glu-Phe. Applicants do not understand among which plurality of inventions Applicants are required to elect regarding STRAD.

**B. No Prima Facie Case of Serious Burden Has Been Made**

When the Office takes the position that inventions as claimed are independent or distinct under the criteria of MPEP § 806.05(c) - § 806.06, the Office must establish that there would be a serious burden if restriction is not required. The Examiner has provided no evidence or explanation whatsoever as to why, in the absence of restriction, there will be undue burden on the Office.

Applicants submit that there is no undue burden in examination of the claims as currently presented, and in fact restriction places an undue burden on the Office and on Applicants in that it will require numerous additional divisional applications to be filed to obtain examination of the subject matter in question. The lack of undue burden is illustrated by the fact the claims in their previous form were generic, and encompassed all of the listed SEQ ID NOs. As the claims that are generic have already been examined on the merits in generic form (see, for example, the office actions of 5/19/2008 and 2/25/2009), there is no undue burden on the Examiner to continue to do so.

Restriction should occur as early as possible during prosecution, so that duplication of the Examiner's efforts in examination the application does not occur. “37 CFR 1.142(a), second sentence, indicates that a restriction requirement ‘will normally be

made before any action upon the merits; however, it may be made at any time before final action.’ This means the examiner should make a proper requirement as early as possible in the prosecution, in the first action if possible, otherwise, as soon as the need for a proper requirement develops.” MPEP 811. Before making a restriction requirement after the first action on the merits, the examiner must consider whether there will be a serious burden if restriction is not required. There are specific situations in which restriction after the first office action on the merits is warranted, for example if the Applicant amends or adds claims such that they become independent or distinct from the claims as originally filed.

However, this case is not such a special situation.

In this case, the Office has already searched all of the claims in Group II in generic form without undue burden. Two complete Office Actions on the merits have been issued which have considered the patentability of all pending claims including the relevance of alleged prior art. As shown in the Patent Application Information Retrieval system, searches were conducted at least on 2/25/2009, 5/19/2008, and 3/13/2008. If restriction is required at this advanced point in prosecution, both the Office and the Applicant will be forced to repeat the work that has been performed up until this point, imposing a significant burden on both parties. Continued examination of both groups of claims together will be a far smaller burden on both parties than would restriction.

For these reasons, Applicants respectfully request that the Examiner reconsider the restriction requirement, and that examination of all claims continue.

**C. Restriction of Markush Group Elements is Improper**

The Applicants submit that the Office has set out a particular procedure to be followed when an Examiner requires restriction between elements listed in a Markush group. In this case, the procedure has been violated.

The requirements for unity of invention among members of a Markush group are explained in Annex B of the Administrative Instructions Under the PCT. Elements of a Markush group share unity of invention “when the alternatives are of a similar nature.” Annex B (f). The alternatives are of a similar nature if (1) all alternatives have a common property or activity, and (2)(a) all alternatives belong to a recognized class of chemical compounds in the art to which the invention pertains or (2)(b) a common structure is present. In this case, the requirements are met by all of the Markush groups in question.

The LKB1 Markush group of Claim 3(a) and Claim 19(a)(ii)(A) include the elements “residues 44-343 of SEQ ID NO: 6, a variant thereof having a conservative substitution, and a variant thereof having at least 65% sequence homology.” Both claims further recite that the LKB1 polypeptide phosphorylates or activates AMPK.

The requirement for a common property or activity is met by the limitation that the LKB1 polypeptide phosphorylates or activates AMPK. The requirement of membership in a recognized class of chemical compounds is also met. It is written in Annex B(f)(iii) that “the words ‘recognized class of chemical compounds’ mean that there is an expectation from the knowledge in the art that members of the class will behave in the same way in the context of the claimed invention. In other words, each member could be substituted one for the other, with the expectation that the same intended result would be achieved.” In this case, as stated above, the elements are limited to those that phosphorylate or activate AMPK. Furthermore, a variant of a given

polypeptide having conservative substitutions would be expected to retain the functionality of the native polypeptide; as a result, conservative variants of residues 44-343 of SEQ ID NO: 6 would be expected to behave the same way as would residues 44-343 of SEQ ID NO: 6 in the context of the claim.

Similarly, a variant having at least 65% homology to residues 44-343 of SEQ ID NO: 6 would share a common structure with SEQ ID NO: 6. It is explained in Annex B (f)(ii) that “the words ‘significant structural element is shared by all of the alternatives’ refer to cases where the compounds share a common chemical structure which occupies a large portion of their structures.” In this case, the alternatives share at least 65% of their structures. Applicants submit that 65% of the entire structure of SEQ ID NO: 6 is a “large portion.”

For the reasons explained above, the elements of the Markush groups in Claim 3(a) and Claim 19(a)(ii)(A) share unity of invention.

The MO25 Markush group in Claim 3(c) and Claim 19(a)(ii)(C) recites a MO25 polypeptide that binds to STRAD, and includes the Markush elements of the polypeptides of SEQ ID NO: 11-15 (shown in Figure 2A as amended), a variant of the foregoing having a conservative substitution, and a variant of the foregoing having at least 65% sequence homology.

Among the five SEQ ID NOs listed, the common property is the claimed property of binding to STRAD. The SEQ ID NOs share a significant structural element. As shown in Fig. 2A, all five SEQ ID NOs share significant regions of homology.

The MO25 variants having at least 65% homology to one of the SEQ ID NOs listed would share a common structure with the SEQ ID NO. It is explained in Annex B

(f)(ii) that “the words ‘significant structural element is shared by all of the alternatives’ refer to cases where the compounds share a common chemical structure which occupies a large portion of their structures.” In this case, the alternatives share at least 65% of their structures. Applicants submit that 65% of the entire structure is a “large portion.”

The MO25 variants having conservative substitutions would be expected to retain the functionality of the native polypeptide and would be expected to behave the same way as would the native polypeptide. As a result, conservative variants are in the same recognized class of compounds as are SEQ ID NO: 11-15.

For the reasons explained above, the elements of the Markush groups in Claim 3(c) and Claim 19(a)(ii)(C) share unity of invention.

In the alternative, even if one were to assume for the sake of argument that the members of the Markush group are not few in number (Applicants do not admit this assumption), the proper action would be an election of species requirement, not a restriction requirement. The fourth paragraph of MPEP 803.02 explains this (with emphasis added):

In applications containing a Markush-type claim that encompasses at least two independent or distinct inventions, the examiner may require a provisional election of a single species prior to examination on the merits. An examiner should set forth a requirement for election of a single disclosed species in a Markush-type claim using form paragraph 8.01 when claims limited to species are present or using form paragraph 8.02 when no species claims are present. See MPEP § 808.01(a) and § 809.02(a). Following election, the Markush-type claim will be examined fully with respect to the elected species and further to the extent necessary to determine patentability. If the Markush-type claim is not allowable \*\*, the provisional election will be given effect and examination will be limited to the Markush-type claim and claims to the elected species, with claims drawn to species patentably distinct from the elected species held withdrawn from further consideration.

Applicants respectfully remind the Examiner that in a case in which an election of species requirement is made, and the elected species is found to be unpatentable, Applicant may overcome the rejection by deleting the unpatentable species from the Markush group. In such a case Examination must proceed on the non-elected species ("Should applicant, in response to this rejection of the Markush-type claim, overcome the rejection, as by amending the Markush-type claim to exclude the species anticipated or rendered obvious by the prior art, the amended Markush-type claim will be reexamined." MPEP 803.02, paragraph 6).

For the reasons explained above, Applicants respectfully request the restriction requirement be withdrawn and the claims examined on their merits.



## CONCLUSION

The Applicants respectfully request the Commissioner of Patents consider the enclosed remarks and enter the following submission into the record, in response to the Examiner's restriction requirement dated 10/27/2009. If the Examiner requires additional action that may benefit from a telephone call, Applicants invite a call to its attorney of record, Nicholas J. Landau (Reg. No. 57,120). E-mail correspondence and transactions to nlandau@babco.com are authorized and encouraged.

Applicants have diligently sought to comply with all requirements. The Application is believed to be in condition for allowance, and a timely Notice of Allowance is respectfully requested.

Respectfully submitted,  
BRADLEY ARANT BOULT CUMMINGS LLP

27 Jan. 2010  
Date

Nicholas J. Landau  
Nicholas J. Landau  
Reg. No. 57,120